

forming a second insulating layer over said conductive plug and said first insulating layer;

forming a second contact opening in said second insulating layer;

forming a barrier layer in said second contact opening;

forming a copper conductor over said barrier layer; and

forming a heat-radiating layer on an upper surface portion of said copper conductor, said heat-radiating layer comprising a continuous layer of aluminum nitride passivating said upper surface portion of said copper conductor.

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29. A method of forming an interconnect structure providing electrical connection in a semiconductor device comprising:

forming a contact opening in an insulating layer of said device;

depositing a conductor within said contact opening; and

forming a heat-radiating layer comprising aluminum nitride on an upper surface portion of said conductor, said aluminum nitride layer providing a heat dissipating path for said conductor.

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